College & Career Awareness

Program Area(s): Information Technology

Lesson Plan Title: Orange Game — Networking
Network congestion while applying problem solving skills in an interactive game and write about the process.

Estimated Time: 45 minutes

Primary CTE Pathway(s) Explored: Networking and IT Support, Web Development and Administration, Electronics

Intended Learning Outcome(s):
- Become acquainted with a wide range of occupations, CTE Pathways, career trends and emerging careers.
- Participate in experiential activities related to career expectations.
- Consider and explore nontraditional career opportunities.
- Explain how academic content knowledge and technical skills are used in various careers.

College and Career Awareness Pathway Standard, Objective(s):
Standard 7, Objective 3
Standard 7, Objective 3

Cross Curriculum Integration:
- **Reading:** Orange Game — RL2 - Determine a theme or central idea. RL4 - Determine meanings of words and phrases.

Career Opportunities in the CTE Pathway(s): Computer programmer, computer systems administrator, database technical engineer, information security analyst, network engineer, software developer, systems security analyst, telecommunications equipment installer and repairer, VOIP administrator, Web developer

Nontraditional Career Opportunities: Computer programmer, computer systems administrator, information security analyst, network engineer, telecommunications equipment installer and repairer, video game developer, Web developer

STEM Specific Career Opportunities: Computer programmer, computer systems administrator, database technical engineer, electrical engineer, information security analyst, network engineer, systems analyst, systems security analyst, VOIP administrator, Web developer

Curriculum Integration:
- **21st Century or Interpersonal Soft Skills—critical thinking, collaboration, communication, creativity**
- **Engineering:**
- **Technology:**

Methods (Approach to Teaching and Learning):
- Direct Instruction and Demonstration

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- Activity/Inquiry/Practice Centered Instruction

Materials Needed:

Each student will need:
- Two oranges or tennis balls
- Name tag or sticker

Vocabulary:
- Collision
- Network
- Packet

Prior Knowledge Required by Students:
- When you have a lot of people using one resource (such as cars using roads, or messages getting through the Internet), there is the possibility of "deadlock". A way of working cooperatively is needed to avoid this happening.

Instructional Procedures:

Discussion:

Begin with a discussion of how traffic can get congested or "deadlocked" if people don't follow specific traffic rules, like stopping at red lights, or how a 4-way stop intersection works. Compare this to how a network is effective because computers can transfer information (files broken down into small packets), but also can have congestion and deadlock or collisions with packets traveling through the connections.

Break the students up into groups of five or more and follow the instructions included in the CS Unplugged Lesson—The Orange Game.

See the unplugged-10-routing_and_deadlock.pdf that can be downloaded from http://csunplugged.org/routing-and-deadlock

Additional Resources:

The Web page for CS Unplugged – Routing and Deadlock has video examples of how the game works.
http://csunplugged.org/routing-and-deadlock

Videos:
- Networking company Customer Solutions
  http://www.nextvista.org/networking-company-customer-solutions-architect/
- Network Administrator
  http://www.nextvista.org/network-administrator/
- Google's driverless car
  https://www.youtube.com/watch?v=bp9KBrH8H04

Assessment(s):
- Explanation of concepts (written, oral, or through demonstration or performance of particular skills).
- Critical thinking demonstration (written, oral, or through demonstration or performance).